INSTITUTION

AMERICAN MEDICAL TIMES

Being a Weekly Series of the New York Journal of Medicine.

No. XV. / Vol. VII. } New Series. NEW YORK: SATURDAY, OCTOBER 10, 1863. { *Mail Subscribers, $3 per Ann.* / *City and Canadian, 3 50 "* / *Single Numbers, 10 cents.*

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[Being a Paper read before the N. Y. Academy of Medicine, February 18 and March 4, 1863.]

PART V.

UNCERTAIN CASES.

Case 165, M. 12 yrs.
" 166, M. 10 mos.
" 167, M. 21 yrs.
" 168.
" 169, F. 2 weeks.
" 170, F. 12 hours.
" 171, M. 16 years.
" 172.
" 173, 30 hours.
" 174, M. 18 years.
" 175, M. 49 "
" 176, M. 24 "
" 177, F. 20 "
" 178, M. 20 mos.

Case 179, 7 weeks.
" 180, 11 months.
" 181, 10 weeks.
" 182, F. 7 months.
" 183, F. 4 weeks.
" 184, 7 months.
" 185, F. 12 years.
" 186, F. 18 "
" 187, F. 3½ "
" 188, F. 9 "
" 189, F. 24 "
" 190, F. 36 "
" 191, F. 15 "

There may be anatomical errors or vices producing cyanosis which differ from those mentioned; but from the rarity of such it is safe to refer any case of this disease to one or the other of the above malformations. It is probable the art of diagnosis will never be so perfected that the nature of the malformation can be accurately diagnosticated from the signs or symptoms.

The fact must not be overlooked that these malformations are sometimes present without cyanosis. This is evident from the statement previously made, that the blue disease may not appear for months or years, although it depends on a congenital defect of structure. In many, probably most of these cases of the non-appearance or deferred appearance of cyanosis, there is some mode of compensation, which usually is such as increases the flow of blood to the lungs. The following may be mentioned as examples. Dr. Quain presented to the London Path. Soc., May 5, 1857, the heart of a child who died at the age of ten months. There does not appear to have been lividity, so far as can be determined from the history. The heart was in the condition described in the first malformation. The orifice of the pulmonary artery was so small as to be practically obliterated, and the aorta was of twice the usual size. "From the posterior third of the arch, and from about one inch of the descending aorta, branches, three on each side, were given off to the lungs. The middle branch on the left side communicated with the pulmonary artery, which was pervious, except at its origin." These branches evidently compensated for the obstruction at the mouth of the pulmonary artery.

Another case was related by Dr. Sieveking, before the London Path. Soc., November 1, 1853. The infant lived six weeks. The tricuspid orifice was closed, so that there was no direct communication between the right auricle and right ventricle, and between the auricles was an aperture large enough to admit the first phalanx of the finger. The left ventricle was hypertrophied, so as to form nearly the entire ventricular portion of the heart, and it gave origin to both the aorta and pulmonary artery. To the right of this ventricle, and opening into it, was a small cavity, evidently the rudiment of the right ventricle. The pulmonary artery was twice the size of the aorta. The state of the heart in this patient was similar to that described under the head of *Second Malformation*, there being this difference between this case and those in which cyanosis was present, that the pulmonary artery was so enlarged as to receive two-thirds of the whole amount of blood at each ventricular systole. The blue disease appears to have been prevented by this enlargement of the pulmonary artery and the consequent increased arterialization.

Dr. Peacock related before the same Society, October 17, 1854, the history of a child, eight months old, who was not cyanotic, but during attacks of dyspnœa had slight lividity about the face. Both auricles opened into the left ventricle by separate orifices. This ventricle gave origin to the pulmonary artery, which measured twenty-four lines in circumference. A crescentic opening led from this ventricle into the right, from which the aorta arose only fourteen lines in circumference. In this case, as in the one just related, there must have been almost a complete admixture of the two currents of blood. As both auricles opened in the same ventricle there were virtually but three cavities, as in the *Sixth Malformation*, and, besides, the large arteries were transposed. In this case cyanosis seems to have been prevented by the relatively larger size of the pulmonary artery than of the aorta, and its more favorable location, so that the pulmonary current must have been considerably larger than the systemic.

In the Medico-Chir. Trans., vol. xxv., Mr. Fletcher relates the case of a female patient, nineteen years old, in whom the aorta was constricted at the ductus arteriosus, so as to be not more than one-ninth of the size of the ascending portion. The *Fourteenth Malformation* was present, but the internal mammary arteries, which were of extraordinary size, established a collateral circulation, and compensated for the obstruction. In the Medico Chir. Trans., vol. v., p. 287, a similar case is published by Robert Graham, M.D. The patient, a male, attained the age of fourteen years, and followed the occupation of weaver. In this case the aorta was impervious at the ductus arteriosus, but the intercostal arteries were found enlarged, and as these by anastomosis unite the portions of the aorta each side of the ductus arteriosus, it is evident that they supplied the deficiency in the aorta, so that the patient, instead of being livid, had a florid complexion.

And this leads us to speak of compensation in cases of cyanosis, a subject of great interest, but to which few observers have given attention. It is evident that modes of compensation, which are sometimes sufficient to prevent cyanosis, may in those cases in which cyanosis is present serve to moderate it and lead to the prolongation of life. The following may be mentioned as examples:—

In a cyanotic male patient, treated by M. Jacobson (No. 75), the pulmonary artery was not more than one-fourth the size of the aorta, and its orifice was greatly contracted by thickening of its valves. "But to compensate for this the bronchial arteries were very much enlarged; three of these vessels passed off from the right and left sides of the aorta to the lungs, and a branch was distributed to either lung from the pericardial artery."

Mr. Le Gros Clark published in the Medico-Chir. Trans., vol. xxx., the history of a male patient (No. 117), nineteen years old, in whom cyanosis was produced by a supernumerary septum in the right ventricle, but there was this mode of compensation: "bronchial arteries unusually large and tortuous, and the branch from the internal mammary artery, which accompanied the phrenic nerve, was nearly equal in size to the parent trunk, and expended itself principally in the adjacent adherent lung." In No. 150, described by Tiedemann, the bronchial arteries were also greatly enlarged, and after being injected were traced everywhere into the lungs.

The intercostal, internal mammary, and bronchial arteries, are not likely to be noticed in an autopsy, and from the above observations it is probable that they are often enlarged in cyanosis, so as to take on a vicarious function. The increase of muscular fibres in the heart, the presence of apertures in the septa to relieve the congestion, and especially the development of insignificant arteries, so as to answer an important purpose in the circulation, afford a

striking exemplification of the wonderful resources of nature in obviating defects.

Although in nearly all cyanotic patients there are direct communications between the two sides of the heart, it is shown by many observations that these communications or apertures are not sufficient in themselves to produce cyanosis. This opinion was expressed nearly forty years ago by Louis, who published an excellent monograph on the subject of these communications, basing his remarks on an analysis of twenty cases. Since the publication of this paper the belief has been pretty general in the profession, and observations continue to substantiate it, that although the apertures may be of considerable size, if the two sides of the heart, with their orifices and vessels, are in their normal state, so that they act symmetrically and without obstruction, and there be nothing to disturb their regular action, cyanosis will not occur. In proof of the correctness of this opinion many cases might be cited of a pervious, and some of a largely dilated foramen ovale without the cyanotic hue, cases which have been published in the journals since the appearance of Louis's monograph. To remove any doubt which may exist on the subject, the following may be mentioned as striking examples in which the inter-auricular or inter-ventricular septum or both were incomplete, without the occurrence of cyanosis:—

In the L'Experience, January, 1838, is the history of a shoemaker, who died at the age of twenty-six years, of pneumonia. He had always suffered from palpitation. The heart was very large. "All the cavities and orifices were very wide and open." The foramen ovale was closed, but the inter-ventricular septum was deficient to the extent of an inch in diameter. In the London Med. Gazette, April 21, 1843, quoted from the Trans. of the King's and Queen's College, Dublin, is the history of an individual in whom the inter-auricular and inter-ventricular septa were both virtually absent, without the occurrence of cyanosis.

Dr. Hare presented to the London Path. Soc., April 17, 1848, the heart of a female infant, who died of pneumonia, at the age of five months. The septum between the auricles was perfect, but that between the ventricles had an aperture half an inch in diameter. Dr. Hare also gave the history of another case, in which the foramen ovale was pervious, and there was an aperture in the base of the inter-ventricular septum three-sixteenths of an inch in diameter.

At a meeting of the London Path. Soc., January 18, 1853, Dr. Hale presented a specimen taken from a child ten weeks old, in whom the pulmonary artery was unusually large, and the aorta of its ordinary size. The septum ventriculorum was almost entirely absent, and the foramen ovale open and of large size. In the Arch. Gén. de Méd., February, 1843, is the history of a foundling child, who died at the age of eleven days from umbilical phlebitis. The septum between the auricles and that between the ventricles, were both absent. A very similar case is related by Farre, but the child died at the age of seventy-nine hours. In all these cases the two sides of the heart were fully developed, the vessels were in their normal situations, and gave free passage to the blood.

The presence of apertures between the two sides of the heart, without cyanosis, does not prove that this disease may not occur in consequence of these apertures, for there might be some compensation which prevented its appearance. But when, as is really the truth, many instances may be adduced of communications between the auricles or ventricles, without cyanosis, and none have been mentioned of cyanosis occurring in connexion with this malformation, if also it was certain the two sides of the heart and their orifices were in their normal state, and there were nothing to disturb the regular action of the heart, it is safe to infer that openings in the septa of the heart are not sufficient to produce cyanosis. Still, facts show that in the common obstructive malformations, the blue disease is more apt to occur, or, if present, to be aggravated by the presence of these openings, for during the ventricular systole a larger quantity of blood would pass through the contracted orifice to be arterialized if it did not escape to the opposite side of the heart. If the openings are large, slight obstruction or irregularity of the heart's action, especially from inflammatory and febrile affections, is sufficient to produce the cyanotic hue. For example, in the Gazette des Hôpitaux, August 24, 1861, Gérard relates such a case, in which there were three inter-auricular apertures, but no lividity was observed till the heart's action was disturbed by an attack of bronchial inflammation. On the other hand cyanosis is not apt to occur, although there be much obstruction, if the septa are complete. It will be recollected that in the tables of cases only one such is given. This explains the fact that cyanosis rarely occurs unless the obstruction is congenital, for it is only in such cases that the two sides of the heart inter-communicate. In support of this view may be mentioned two cases reported by Dr. Elliotson in the London Med. Gaz., vol. x., and one by Dr. Peacock published in the Lond. Lanc., June, 1859—adults of the ages of twenty-three, thirty-nine, and sixty years. In all the pulmonary orifice was contracted, and it can scarcely be doubted that the blue disease would have been present had there been free communication between the pulmonary and systemic sides of the heart.

We now approach the question—What is the proximate pathological state which gives rise to cyanosis? Allusion has already been made to the two theories which prevail in the profession—the one attributing the disease to the intermingling of venous and arterial blood; the other to obstruction at the centre of circulation, and consequent venous congestion.

That the former theory is absurd, in other words, that admixture of the two kinds of blood is not essential to the production of cyanosis, is apparent from the following facts. In one case in the *Fourth Malformation*, there was no communication between the two sides of the heart, and the ductus arteriosus was closed, so that admixture was impossible. Again, in the *Eleventh Malformation*, or that in which the aorta and pulmonary artery are transposed, the blue disease evidently does not depend on the admixture of the two currents. On the other hand, in this curious state of the heart, the more the admixture the less the cyanosis, since the only way in which the systemic current of blood can be arterialized is by passing to the opposite side of the heart. An argument against this doctrine may also be found in the fact that the modes of compensation are not such as in any way diminish or obviate the admixture. It is admitted that in the more frequent malformations cyanosis is increased by the apertures, which allow the intermingling of the venous and arterial currents, but it is more reasonable to consider the intermingling and the cyanosis as the direct results of the malformation, neither having the precedence of the other, than to consider that they are related to each other as cause and effect, or as proximate and remote results. Viewed in this light, the admixture must be considered simply a concomitant of the cyanosis.

The second theory, that of venous congestion, has numbered among its advocates many who have given special attention to the subject, as Morgagni, Louis, and Stillé, but it seems to have even less claim for acceptance than the theory of admixture. It has been seen that in nearly all cases of cyanosis the two sides of the heart communicate freely, so that if the current of blood meets with an obstruction, as it commonly does, it readily escapes to the opposite side where the artery is large and gives it free passage. In this way congestion, if not prevented, is greatly diminished. Again, it will be seen that, although certain of the viscera are frequently found at the autopsy more or less congested, congestion is not uniformly present in the organs, as it would probably be were it the proximate cause of cyanosis.

Moreover, in some patients the malformation is not ob-

structive. The cavities and their orifices are of the normal size, and cyanosis is due entirely to malposition of the vessels. It cannot be said that in these cases there is venous congestion from arrest at the centre of circulation. If there be any congestion, it must be due to the fact that venous blood does not circulate as readily as arterial in the capillaries. It is true that in the paroxysms of dyspnœa there is sometimes more or less congestion; the distension of the jugulars shows this, but it subsides with the paroxysms, and is probably no more than usually occurs when the respiration is greatly embarrassed.

In fine, attempts to express the immediate pathological state producing cyanosis in the terms of a general law have failed. However plausible the above theories may appear in regard to certain cases, there are others to which they are manifestly inapplicable. Those who advocate these theories seem to lose sight of the obvious fact, that the chief want of the economy in cyanosis is arterialization of the blood, and it is hardly supposable that there can be any correct theory of its causation which is not founded on this fact. With this want of the economy in view it does not seem difficult to express a theory in comprehensive terms which is applicable to all cases, such as the following: *Cyanosis is due to vices or defects in the organism, usually congenital, which prevent the free and regular flow of blood to, through, or from the lungs.* So comprehensive a statement includes not only cases of malformation and malposition of the heart and its vessels, but also those few cases in which the lungs are in fault. In most patients, as we have seen, the current of blood *towards* the lungs is obstructed, and the current of blood *from* the lungs, in those comparatively rare cases in which the malformation is on the left side.

Physicians, in their post-mortem examinations of cyanotic patients, have usually directed their attention chiefly to the heart and the vessels in immediate connexion with it, so that their description of other viscera is commonly meagre. The pericardium, so far as can be ascertained from the records, ordinarily presented its normal appearance, excepting more or less distension from effusion within. The character and an approximate estimate of the quantity of effused fluid are mentioned in fifty-one cases. With rare exceptions it was pure serum. In seventeen the quantity was half an ounce or under, if we include in the number those in which the amount is expressed in such terms as "due quantity," "usual amount," and "small amount." In twenty-four cases the serum exceeded half an ounce; usually it was estimated at from one to six ounces, but in two it exceeded the latter quantity. In one of the twenty-four the serum was sanguinolent. In two cases the records state that there was a small quantity of blood in the pericardium, and in the remaining patient the two pericardial surfaces were agglutinated by fibrinous exudation.

In some of the autopsies serous effusion was found in the pleural cavities, usually in connexion with pericardial effusion, and in at least one instance the serum was tinged with blood. Old adhesions between the costal and pulmonary pleura were observed in a few instances. The condition of the lungs was recorded with more or less minuteness in 110 cases. Mention has already been made of the large number affected with tubercular disease, which, if not confined to the lungs, was chiefly exhibited in these organs. In thirty-five patients the records state that the lungs were of small size, either by compression, or sometimes, apparently, by the continuance of the fœtal state over a greater or less portion of the organ. The compression was produced either by the distended pericardium or by effusion in the pleural cavities. In thirty-five cases the lungs presented a dark color. This hue in some specimens accompanied the unexpanded or fœtal state of the organ, but in others there was no diminution of the size, and the dark color was due to engorgement or congestion. In other cases the lungs are said to have been natural, except the color. In nine there was emphysema in a part of the lungs, in two pneumonia; in two the color was pale, in one a bright crimson; in one the lungs were larger than natural, in one the right lung was absent, and in seventeen these organs were recorded healthy.

Next to the thoracic organs the viscus which would be most likely to be affected in cyanosis is the liver, since this is largely an eliminator of carbon. Mention is made of this organ in twenty-six cases, in sixteen of which it is recorded enlarged, and in four of the sixteen congested. Congestion is also recorded in eight other cases, in which no mention is made of the volume. The parenchyma had a natural appearance in nine cases, but in some of these there was enlargement. From these observations it is probable that the liver is commonly enlarged in cyanosis, and not unfrequently congested. In a few cases the condition of the other abdominal viscera is mentioned; in some as healthy, in others as congested. There were fifteen examinations of the brain, in seven of which congestion is recorded, and in three abscesses in the cerebral substance, in one of which cases the lateral ventricle was also filled with pus; in two there was softening of a portion of the brain, in three the brain was firm or compact, in three the quantity of serum in the cranial cavity exceeded the normal amount, and in one it seems to have been less.

The character of the blood in cyanosis is a subject of much interest, but about which little is known, except that its color is dark, its coagulability feeble, and, probably from the nature of the disease, carbonaceous products are in excess, while oxygen is in less than the normal quantity. No chemical analysis of the blood in cyanosis has yet been published, so far as I can find. There is reason to believe that the hydro-carbons as well as carbonic acid are in excess in cyanotic blood. That carbonic acid is in excess is probable, from the fact that it is one of the chief functions of the lungs to eliminate it. That the hydro-carbons are in excess is probable for the following reason:—The only viscus besides the lungs which can eliminate carbon from the system in any considerable quantity is the liver, and, in the words of Dr. Carpenter, "the composition of the secretion ('bile') clearly indicates that it is intended to eliminate from the blood its superfluous hydro-carbon." Now, that this organ does really perform the vicarious function in cyanosis is probable from its usually augmented size. And as the liver cannot rid the system of carbon except in the form of hydro-carbon, and as the hydro-carbons, as cholesterine, are not formed in the liver but are separated as such from the blood, the inference is reasonable that cyanotic blood contains the hydro-carbons in excess. This idea also derives support from the fact that but little oxygen is required for the formation of these substances. But this is a question which can only be decided by chemical analysis.

From the nature of cyanosis it is evident the treatment should be more hygienic than medicinal. The patient should be warmly clad and kept in a warm room, and all agencies calculated to embarrass or disturb the functions of the body or excite the emotions should be studiously avoided. The diet should be simple but nutritious.

Much has been said of position as a means of alleviating the severity of the disease. It will be recollected that Prof. Meigs of Philadelphia made the remarkable statement, some years since, that he had seen the blue color disappear the very instant the child was placed on the right side, with the head and limbs somewhat raised, and that, by this means, he had saved fifty or sixty children in a hundred. These remarks were evidently made in the belief that cyanosis depends entirely on the apertures between the two sides of the heart, and the consequent admixture of the venous and arterial blood. Faith in a theory must have influenced his observation of facts. It is very evident from the character of the malformations that little real benefit can be expected from placing the patient in any one position. In case No. 7, "the only easy and indeed comfortable position in which the child could remain was that usual in nursing. When erect, the dusky color of the face and neck became a dark blue." In Nos. 14

and 64, position on the right side made no difference with the symptoms. In No. 36 the patient was easiest on the hands and knees; in No. 56, with the head elevated; in No. 68 the paroxysm could be avoided by lying on the left side for ten minutes; in No. 24 the patient suffered most when erect; in Nos. 103 and 156 the patients did not feel well except when lying on the right side; in Nos. 99 and 117 the patients lay indifferently on either side; on the other hand, in Nos. 178 and 191 the recumbent position was badly tolerated. From these observations it appears that some obtain most relief by lying on the back, others on the right side, others on the left, some when on the hands and knees, some when reclining on either side indifferently, while, finally, others suffer least when erect.

There was a time when the paroxysms were treated by venesection, but depletion has long since been abandoned. Physicians now rely on stimulants, antispasmodics, friction to the chest, and mustard pediluvia to relieve the urgent symptoms, although this treatment is but partially successful.

Original Communications.

OPERATION FOR THE REMOVAL OF A SINGLE GOITROUS TUMOR OF THE NECK.

By T. S. SMITH, M.D.,
OF LEXINGTON, MISSOURI.

On the 30th of June, Dr. Ruffin, of this city, brought to my office Q. H., a mulatto man, aged 34 years, by occupation a barber, with what he supposed to be an encysted tumor of the left side of the neck. It rested upon the clavicle below, extending to the border of the trapezius muscle on the outside; in front, it rested against the trachea; above, it reached nearly to the inferior maxilla. The patient first noticed it about four years ago; but its growth was slow, until about four or five months ago, since which time it had been growing fast, and had interfered with his breathing when he turned his head to the right. When asleep, if his head turned to the right, he awoke with a sense of suffocation, swimming in the head, amounting almost to vertigo, and was only relieved by sitting up in bed, and getting his wife to fan him rapidly in the face for some minutes.

He was anxious about it, and desirous to have it removed at once, and as his health was good, and the weather fine, the next day, July 1st, at 10 o'clock A.M., was set for the operation. Assisted by Drs. Ruffin, Young, Vaughn, and Wilmot, I commenced the operation by making an incision from the sterno-clavicular junction to the angle of the inferior maxillæ, cutting through the skin, superficial fascia, and platysma myoides muscle. As the tumor was freely movable in every direction, I expected to have reached it at this cut, but finding that I had not reached it, I dissected up the sterno-mastoid muscle, and pushed it as far outwards as I could. The incision was then carefully deepened, until we saw the omo-hyoid muscle lying across the track of the cut. Knowing that it would not do to cut the muscle in two, and finding that we could proceed no further without room, we determined to make another incision, beginning at the middle of the first, and extending across the trachea three inches long.

The flaps made by this incision were turned back, and several large vessels secured by the ligature. This revealed to us the tumor lying under the sterno-hyoid, sterno-thyroid, and omo-hyoid muscles. These muscles were all loosened up with the handle of the knife, and pushed aside, and revealed to us a tumor as large as the fist of a man, covered by a tough membrane, probably adventitious. This was carefully divided across the whole extent of the tumor, and separated from the loose cellular connexion by passing the finger freely all around the tumor.

The tumor was now loose, except at its base, and a strong thick band as broad as the three fingers running across the trachea, and firmly connected to something on the right side. We now had to tie several small and one large artery, and stop the capillary bleeding with ice-water. The tumor was now fully exposed, and we had a fair chance to examine it thoroughly. We had for some time suspected its character, but holding to the generally received opinion that there is no such thing as a single goitre, we were determined to demonstrate beyond a doubt what its true character was.

At its base it was loosely attached to the structures below, but a careful examination by all of us proved it to be firmly attached to the perfectly healthy right lobe of the thyroid gland, by a band as wide as three fingers, and very firm, and at least three-quarters of an inch thick; and in it many large arteries could be felt freely pulsating. It was firmly attached to the carotid sheath, and the superior and inferior thyroid arteries could be seen dipping into its substance. I passed a needle, armed with a strong silk ligature, under the inferior thyroid artery, and tied it; but this wounded the surface of the tumor very slightly, and gave rise to severe bleeding, which neither ice nor the solution of the perchloride of iron would arrest, and we had to grasp it with the forceps, and tie it. It was impossible to get a ligature around the superior thyroid artery without wounding the surface of the tumor, as the artery was imbedded in it, and to have tied it close to the parent vessel would have been to insure a chance for secondary hæmorrhage of a serious character.

There was another vessel which came from the subclavian artery, and was as large as a large-sized goose-quill; this dipped into the tumor on the under side, passed through it, and again showed itself running along the superior border of the tumor for a short distance, then dipped into it again. This artery we supposed to be the transverse colli, or a branch of it very much enlarged. We were very careful to satisfy ourselves that this was not an aneurism, for no pulsation could be felt in it, only at such points where large vessels were passing through it; its outer covering was a very thin transparent membrane, having much the appearance of a serous sac; and the best description that I can give of its appearance is that of a thin sac of bright-pink color, with a broad neck, filled with a number of deep red earth-worms, some at rest, others enlarging and contracting in strict harmony with the heart's movements. To have tied the vessels leading to it, and then have dissected it loose from the sheath of the carotid, and lastly, to have divided its connexion with the right half of the gland, would have left us a large number of arteries coming from the remaining half of the gland, which would have produced fatal hæmorrhage, as they would in all probability have retracted into the gland, and could not have been secured. To have secured the arteries of the right, and have removed both lobes of the body, was hazardous in the extreme.

Considering, finally, all the points bearing on the case, we came to the conclusion that we had better let it remain, that by so doing we were giving him the best chance for life. I pressed the tumor as far as I could from the trachea, replaced all of the muscles, and brought the skin together with ten silver wire sutures and some isingla s-plaster. A wet compress, and roller loosely applied, completed the dressing. We tied fourteen arteries. The operation lasted two and a half hours, most of which time was taken up in examining and consulting. He was under the full influence of chloroform all the while, and took twelve ounces without the slightest untoward symptom. On the 5th day, we removed the dressing, and found the whole of the cut united by the first intention, except when the ligatures came out. At this time, twenty-three days after the operation, he is well, and at his work, and the tumor is reduced one half by internal and external use of iodine.

I believe the existence of single goitre is ignored by all the writers on surgery or pathology that I have seen; but

this case has been demonstrated by the knife on the living subject, as clearly as it could have been on a dead subject: and this man tells me that his mother died of a similar tumor on her neck; had he told me this before I cut him I should not have done so. I am fully convinced of the frequent existence of single goitre in this country—at least, I do not remember to have seen it in any other part of the United States. I know at least a dozen cases in this place, which has a population of from 5000 to 6000. I know one family here, in which four sisters, mulattoes, have a large single goitre. In the white man or woman I have seen only two or three single goitre, and they were either scrofulous or syphilitic subjects.

LEXINGTON, Mo.

COMMENTS UPON THE CASE.

BY PROF. VALENTINE MOTT, M.D., LL.D.

[To the Editor of the AMERICAN MEDICAL TIMES.]

SIR:—I received the inclosed paper some days since from DR. SMITH, of Lexington, Missouri, and forward it to you for publication.

It details a formidable and difficult operation, with an interesting and gratifying result.

It establishes the fact, that one lobe of the thyroid body may be goitrous without the whole body being involved.

I was ignorant of this fact myself, and have taught for over fifty years a different opinion.

Dr. Smith's case is conclusive, as far as a case can go, of the goitrous state of one lobe of the thyroid. And his statement of cases about him is fully confirmatory of the fact.

My observation and experience in this country extend over a long period, and I am certain that I have never seen one side only of this body affected.

My opportunity some years since in Switzerland was extensive, particularly in the Valais country, where at every turn we see goitre. In no instance did I see it on one side.

This fact I published on my return home. An eminent physician in Geneva confirmed me in this opinion.

I have seen and operated upon tumors of the neck which have so much simulated an enlargement of one lobe of the thyroid body, and lying too under the sterno-hyoid and sterno-thyroid muscles, that not until the operation was about finished, did I know the truth; the whole structure of that side being fretted away by the pressure of the tumor, so that nothing but its collapsed tunics remained.

One which I lately removed, nearly the size of my two fists, was of this description.

Yours truly,

V. MOTT.

NEW YORK, Sept. 25, 1863.
1 Gramercy Park.

ON THE TREATMENT OF
GUNSHOT FRACTURES OF FEMUR AND TIBIA.

BY JOHN T. HODGEN, M.D.,

SURGEON U.S. ARMY.

I DESIRE once more to tax the patience of your readers on the subject of gunshot fractures of the femur and tibia, and the appliances for their treatment.

Amputation in these cases has been pretty generally abandoned by our army surgeons, except when joints, blood-vessels, or nerves, are implicated. To this practice of preserving limbs, they have been guided by the facts accumulated during the present war. But the best mode of treatment, and the amount of interference on the part of the surgeon, seems not to be so fully determined.

When a ball strikes a long bone, there is more or less shattering, and a greater or less number of fragments are detached from all connexion; others, though separated from bony parts, still adhere by periosteum.

Now, there is no question but that the duty of the surgeon, immediately after such injury, is to remove all the completely separated fragments; but as to those still holding their periosteal relations (since the periosteum is the framework by which the blood-vessels reach the bone, and the presumption being that the vessels are still in condition to transmit blood to the bone for its nourishment), each fragment, however small, serves as a nucleus from which the material destined to unite the bone is effused. It therefore becomes desirable to save all such fragments, instead of resecting in continuity, as has been practised by many of our surgeons, as I think to the disadvantage of the patient.

I would say, then, that resection in continuity is never profitable; and that it diminishes the chances of recovery with a useful limb, as it removes a part of the material, which, if left, would aid in the union.

Meddlesome interference often diminishes the chances of recovery. In compound comminuted fractures, it is a common practice to use the probe freely every few days, with the view of detecting detached fragments that may be a source of irritation. The surgeon is impatient for the removal of dead and, yet fixed portions of the bone; and, finding a pair of forceps in his case of instruments, he is tempted to use them in cutting off the offending part, and thus causes an inflammatory action that results in the death and final separation of a much larger portion than would have otherwise been lost, to say nothing of the suffering and prostration of the patient necessarily following such interference. It must be remembered that several weeks are required by Nature, in her efforts at removing foreign matters, to cut loose a piece of dead bone, so that the surgeon's forceps may remove it.

Again, limbs are too frequently moved for the purpose of cleansing them; not that I object to having them kept clean, but the disturbance which is necessary, in consequence of the imperfect appliances used in supporting the limb, is sure to retard, if it does not altogether prevent union.

I would say in these cases of compound comminuted fractures of the femur and tibia, remove all fragments that are entirely free; when this is done, make no further explorations in search of dead or detached fragments for six weeks, or two months. Place the limb in the position in which it is destined to remain during treatment, and so arrange the apparatus that it will not be necessary to remove it in keeping the wound free from irritatory discharges.

In the AMERICAN MEDICAL TIMES, of the 21st of May, of the present year, I gave a cut, and description of a cradle-splint (as I call it), which has been used with advantage. Since that time I have used a more simple apparatus, and found it to answer all the ends served by the first, and in some respects to be more desirable.

The splint referred to is a combination of the principles of Smith's anterior splint, Swinburn's extension, and the strip bandage supports used in my cradle-splints. The cut gives a clear idea of it as applied.

The body of the splint is made of No. 2 iron wire, which is sufficiently strong to support the limb, all of one piece, bent as seen in the cut.

The dimensions are as follows:—Four inches across the bottom of the foot; twenty-two inches from the foot to bend at the knee; twenty inches from the bend of the knee to the upper ends of the wire (corresponding to the pubes and hip when applied). These upper ends are eight or nine inches apart, being separated by a bow of thick wire; another similar bow is placed at the knee, having a span of six inches.

These two bows are made so that they can be put on or taken off without disturbing the dressings, and are put in position after all else is arranged—the one at the hip having a loop at each end to receive the upper ends of the

splint wires, the other simply hooks, to be looped on at the knee.

How Applied.—A bandage is applied to the foot; adhesive straps, three inches wide, are applied each side of the leg, extending four or five inches below the foot, and up to the knee in case of fracture of the femur; to the fracture, in case the tibia is the injured part. The roller is then extended smoothly over the adhesive plasters.

That limb of the splint designed to pass next the pubes is bent upwards, at a point from the bend of the knee in the splint corresponding to the distance from the bend of the knee to the pubes on the sound side of the body.

Strips of bandage three inches wide are now looped over one limb of the splint, continuously from the upper to the lower end, and allowed to belly downwards a distance equal to two-thirds of the diameter of that part of the extremity designed to rest upon each one; the other ends of these strips are pinned over the other limb of the splint, thus forming a double inclined trough in which the extremity is now to be placed. The free ends of the adhesive strips are next fastened to the cross-piece at the foot, three inches apart, and the whole suspended from a pulley fixed to the ceiling, or a frame; the pulley should be almost directly over the foot, giving the suspending cord an oblique direction, that in this way we may have sufficient extension.

If the patient is disposed to slide towards the foot of the bed, this must be elevated on two bricks under each of the legs at the foot of the bedstead.

The advantages claimed for this arrangement, are:—

1st. That the limb is entirely free from compressing bandages, so that circulation and nutrition are uninterrupted; consequently repair goes on in its wonted course.

2d. The limb may at any time be examined without disturbing the dressings.

3d. Any one of the supporting strips may be removed and replaced without displacing the fracture; consequently the external wound may be frequently dressed, and all offensive matter removed as often as may be required.

4th. The absence of the perineal band, and the limb being suspended on strips of muslin, there can be no perineal excoriations, no ulceration of the heel, while every part of the limb is kept cool in the hottest weather.

5th. The freedom with which the limb moves in obedience to impulses received from the hip and upper part of the thigh, allows the patient to sit up, to move to any part of the bed, or lift himself on a bed-pan, without disturbing the fracture or causing the patient the least pain.

All of these requisites are not answered by any other splint in general use. Dr. Smith's anterior splint embraces all the qualities required for simple fractures; but it is not, in my opinion, so well adapted to compound fractures, as it does not admit of the limb being so easily inspected, or offer the same facilities for dressing.

St. Louis, Mo., Sept. 11th, 1863.

Reports of Societies.

NEW YORK ACADEMY OF MEDICINE.

Stated Meeting, September 16, 1863.

DR. JAMES ANDERSON, PRESIDENT, IN THE CHAIR.

A REPORT ON THE PROPERTIES AND COMPOSITION OF THE RIDGEWOOD DISINFECTING POWDER.

A report was received from the Section on Public Health and Legal Medicine, through its Chairman, Dr. Griscom, on the *Ridgewood Disinfecting Powder*, which had been presented to the Academy a few months previously, and referred to that Section for examination and report.

After some general remarks on the superior value of solid and fluid disinfectants over those of a gaseous form, chlorine and nitrous acid, etc., as going directly to the source of the evil, and preventing its formation or escape, instead of attempting to control the noxious matters after their dissemination, as gaseous correctives can only do, the report gives the details of several experiments which were made to test its alleged deodorizing and disinfecting properties.

The first test to which it was subjected was on the contents of a vessel in which a number of small bones had been macerating in water several weeks, giving forth an intolerably offensive odor; a handful or two of the powder being thrown in the vessel, in five minutes the offensiveness was entirely corrected, and when examined three months afterwards (at the close of the intensely hot summer), the good effects remained as manifest as at the first. The bones were found entirely denuded, in perfect preservation, and they as well as the water odorless.

The second experiment was a comparative one. The carcases of two dogs which died on the same day, were placed one on the ground, exposed to the influence of air and sun; the other, enveloped in a bed of the powder, about two or three inches thick. On the fifth day, the temperature all the time being considerably over 100°, the first carcase was found completely decomposed and yielding a most fœtid effluvium. This effluvium was immediately arrested by throwing upon the remains a pound or two of the powder. Upon removing the other body from its bed, it was found in an almost perfect state of preservation, the only manifestation of decay being some swelling of the trunk from the internal generation of gases. The inference from this experiment was, that the ridgewood powder acted as an *antiseptic*, as well as a deodorizer. About four weeks afterwards, the great heat of the weather having continued in the meantime, the second carcase (having been replaced in its powdery bed) was found to have undergone some decay, evinced by a partial denudation of the skin of its hair, and some apparent softening of the flesh. It was however, considering the state of the weather, and the length of time, in a remarkable state of preservation.

A third experiment was made by eviscerating a small animal, and sprinkling the cavities with the powder, as well as covering the body externally with it. This was to avoid the generation of intestinal gases. The result was that after four weeks, the body being again exposed, the flesh was found dry, well preserved, and inodorous, the process of decomposition, to all appearance, having been suspended.

From these results it would seem that this article would prove a valuable assistant to the undertaker, in the preservation of bodies, especially after post-mortem examinations.

Other experiments were reported by the Committee, all going to prove its power of deodorizing decaying matters, and preventing decomposition.

In addition to the experience thus obtained by the section, other evidence was collected from the reports of several military hospitals in Washington and elsewhere, where the new disinfectant had been tried. This testimony was strongly corroborated. The ability of the Ridgewood powder to control the ammoniacal odor of stale urine, to correct the smell from water-closets, to remove the offensiveness of the post-mortem room, when sprinkled on the floor, etc., and to check the decomposition of the dead bodies, even after its commencement, were strongly testified to by several surgeons-in-charge, among whom we recognised several well known names, as Drs. Paul B. Goddard, Antisell, U. H. Butler, Judson, and others which we do not recollected.

Dr. Butler, of the Armory Square Hospital, states in his report to Medical Director Abbott, "the superintendent (of the dead house) reports that on sprinkling a moderate quantity on badly decomposed bodies, the offensive effluvia disappeared; and he gives it as his opinion that it is the best disinfecting agent we have used."

The composition of this powder, as given in the report to the Academy of Medicine, is as follows:—Carbolic acid, five to eight per cent.; sesquichlor. ferri, two to five per cent.; charcoal or pulverized pumice, five per cent.; lime, from magnesian limestone, five per cent.; Fuller's earth, seventy to eighty per cent.; and a trace of the sulphates of potash and soda.

From the facts above reported, and an examination of these components, it is manifest that this powder is a valuable addition to the list of deodorizers and disinfectants, and that while others, as the nitrate of lead, chloride of zinc, and permanganate of potass, are equally efficacious, and perhaps better adapted to some necessities, especially about the persons of the sick in hospital wards, etc., the greater cheapness of the Ridgewood powder must commend it in all other localities, and for general use.

The report to the Academy concluded with a recommendation of its use in stables, especially in cities, as a means of preventing the unpleasant odors from the animal fæces and urine, and as a means of retaining in the manures, the gases whose escape impairs value for agricultural purposes, at the same time that they infect the air.

Its general use in the filthy courts, cellars, privies, and even in the streets and gutters of the city (instead of the lime which we sometimes see so freely and uselessly distributed), would doubtless have a happy effect in purifying those nauseous localities; and the same may be said of many of the camps and fortifications of the army, especially of those cities which have recently been captured from the rebels, and as is always the case after long military occupation and siege, are in shockingly unsanitary condition.

Surgical Instruments constructed of Aluminium Bronze.—M. Morel-Lavallée has recently made a very favorable report to the Paris Society of Surgery upon a pocket-case of instruments fabricated by MM. Robert and Collin of aluminium bronze, consisting of ninety-five parts of copper and five of aluminium. All the instruments except the blades are made of this material, and they may advantageously replace silver in many cases, and in others iron or even steel. The alloy is not oxidizable, and preserves its brightness amidst the various agents it is brought in contact with in daily practice.—*Lancet.*

Enlargement of the Heart in Chlorosis.—Dr. Strak believes that sufficient attention has not been paid to this complication. He adduces four cases in which enlargement of the heart was observed during the progress of the chlorosis, diminishing again as the original disease underwent amendment.—*Archiv. der Heilkunde*, 1863, No. 1.

American Medical Times.

SATURDAY, OCTOBER 10, 1863.

SICKNESS AND DEATH-RATES IN THE ARMY.

How much life and vital force does the great War for the Republic necessarily and inevitably require, and how much does it needlessly waste, are questions that not only concern every citizen and every home in the land, but profoundly concern the State and the great interests of civilization and humanity.

In Circular No. 15, from the Surgeon-General's Office, which has just reached our table, we discover how these vital questions are being studied in the Medical Bureau, and how wrought out in practical labors by medical and commanding officers in the field. And we are free to say that the manner and the results of such working, both at the Bureau and among the tented myriads where the nation's life struggle is progressing, do far better defence of the Medical Staff, and more emphatically pronounce its deserved encomium, than aught we can write. Not to sympathize in such labors, and not to aid and sustain the men upon whom devolve the life-conserving duties in this great war, is unworthy men claiming membership in our profession, or citizenship in the Republic. And with augmented emphasis would we apply this remark to any military surgeon who may, in heart or even practically, by his negligence of official and defined duties, be charged with such indifference.

It is a fact well known to the profession that, in the earlier period of the war, it was regarded as doubtful whether the suddenly gathered medical staff of the volunteer army could or would be brought into the habit and duty of faithfully reporting statistics, and practically enforcing systematic sanitary regulations, and exact hygienic observations. We have reason to believe that it was the painful recollection of such failures in the official duties of volunteer surgeons in the Mexican War, no less than his humane purposes, that led that veteran surgeon, Dr. Robert C. Wood, the acting Chief of the Bureau, at the very opening of the war, not only to request the War Department to sanction the organization of the United States Sanitary Commission, but actually to accept an appointment in that Commission, and become one of its effective workers.

These remarks are justified by the history and progress of sanitary inquiry and sanitary works in the army medical department; and if our readers will examine the following figures and quotations from the circular before mentioned, they will obtain some idea how the work of sanitary inquiry and improvements was conducted during the first year of the war, and how the study of military hygiene and the vital statistics in our vast armies are now systematized and progressing in the medical bureau.

Dr. J. J. Woodward, who is in charge of the preparation of the medical history of the armies in the field, reports under date of September 2d, that

"In accordance with instructions from the Surgeon-General, directing me to prepare a brief statement of some of the more important facts with regard to the influence of season and region on the camp diseases of the army, as exemplified by the statistics of the first year of the rebellion, I have the honor to sub-

mit for your consideration the accompanying tables and diagrams, with a few brief remarks.

"The compilation of the medical statistics of the year ending June 30, 1862, has now been completed for some time, and the manuscript of the first volume of the medical history of the war, of which these statistics form a part, will, it is believed, be ready in time to be laid before Congress at its approaching session.

"Elaborate statistical tables, with accompanying diagrams, have been compiled separately for each of the great armies in the field, all of which have important bearings upon the subject now under consideration. To present these tables would, however, require a volume of some size, and is therefore out of the question at present; I therefore merely offer certain general facts with regard to a few points of interest, such as the mortality rates, the general sickness rates, and the prevalence of a few of the most important diseases during the first year of the war."

The reporter proceeds to state, that "the general mortality rate of the armies of the United States during the first year of the rebellion was 67.6 per thousand of mean strength, including with deaths from disease those from wounds and injuries. The mortality from disease alone was 50·4 per thousand, that from wounds and injuries of every kind 17·2 per thousand."

A summary of the mortality statistics is presented in the following table:—

Monthly mortality rates of the armies of the United States during the year ending June 30, 1682, expressed in ratio per thousand of mean strength.

	1861.						1862.						
	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	For the year.
Atlantic border.	2.00	2 06	1.79	2 04	2.68	3.24	2.93	2.43	2.58	3.16	3.27	3.53	33.40
Central region.	1.02	2.73	3.49	4.66	6.36	6 61	8.68	9.27	10.66	6.67	7.40	6.15	82.19
Pacific border	1.45	1.48	1.18	1.54	1.43	0.91	0 21	0.44	1.03	0 36	0.00	0.44	10.76

Respecting the general prevalence of disease, Dr. Woodward states that:—

"The difference between the three regions above contrasted is not so conspicuous in the general sickness rates as in the mortality, yet the whole number taken sick in the central region was greater than on the Atlantic coast, and in this again greater than on the Pacific. In the first, the number taken on sick report during the year was 3368.14 per thousand of mean strength; in the second, 2748.83, and in the third, 2586.60. It will thus be seen that in each of these regions a large proportion of the troops must have been taken sick several times during the year."*

"Under the head of camp fever, all the cases reported to the Surgeon-General's office as typhus, typhoid, common continued, and remittent fevers, are here included. Of these several categories it may well be doubted how far the cases reported as typhus were really of that character. From the details furnished by sanitary reports it appears probable that, with perhaps rare exceptions, what was regarded as typhus was, in fact, of a very different nature, severe typhoid fever, with cerebral complications, and congestive intermittents in scorbutic constitutions being shown, in some cases at least, to have been regarded as typhus. This error was not, however, very widely diffused, the whole number of cases reported as typhus amounting to but a few hundred. As for the cases reported as common continued fever, the vast majority appear to have been different only in degree of severity from those reported as typhoid or remittent. Moreover, while a certain amount of uncomplicated enteric and remittent fever certainly did occur, especially at the commencement of the war, the vast majority of the camp fevers of the army were of a mixed character, exhibiting undoubted enteric phenomena, variously combined with the periodicity and other peculiarities of malarial disease, and still further modified by the tendency to incipient scurvy, which is the ordinary concomitant of camp diet. To indicate this mixed nature, the term typho-malarial fever, which I had the honor to suggest to the department in June, 1862, appears appropriate, and, at the present time, is coming into very general use.

"A correct understanding of the nature of these fevers is of the utmost importance, as they play a conspicuous part in the mortality of our armies. During the year under consideration 44.5 per cent. of all the deaths from disease were due to camp fevers.

"An examination of Table III shows that the frequency and mortality of camp fever differs considerably in the three regions. On the Atlantic border the annual ratio of cases was 238.99 per thousand of mean strength, and the ratio of deaths to cases was 71.9 per thousand, or one death to every 13.9 cases. In the central region the annual ratio of cases was 319.94 per thousand, and the ratio of deaths 101.8 per thousand cases, or one in 9.8. On the Pacific coast the annual ratio of cases was only 60.95 per thousand, and the ratio of deaths to cases 45.2, or one in 22.1. The severity of camp fever in these several regions is thus shown to differ as considerably as their frequency."

"Diarrhœa and dysentery caused about one-fourth of all the sickness reported. On the Atlantic border more than half the army suffered, and in the central region the number of cases almost equalled the mean strength. Although not nearly so fatal as camp fever, affections of this class were an important cause of the mortality of our army. In the chronic cases, though most generally called diarrhœa, and not dysentery, the colon was the seat of the chief lesion. The most characteristic post-mortem appearance was a thickened, softened condition of the mucous membrane, with pigment deposit and enlargement of the solitary follicles, frequently terminating in ulceration, the ulcers being sometimes punctiform, sometimes extensive, and irregular. In this condition the small intestine fre-

* "*Monthly sickness rates of the armies of the United States during the year ending June 30, 1862, expressed in ratio per thousand of mean strength.*

	1861.						1862.						
	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	For the year.
Atlantic border..	391 85	372.18	298.26	267.14	255.90	230.99	199 92	183 33	167.25	214 52	208.45	289.75	2748.83
Central region..	258.65	856.91	325.40	326 11	300.24	305.71	323.55	249 85	252 61	284.32	259.70	232.83	3368.14
Pacific border...	198 91	200.37	245.27	210.19	279.32	193 84	201.18	258.27	236.67	186.08	157.47	193.51	2586.60

quently participated, more or less, but often produced nothing abnormal."

"Great efforts have been made during the fiscal year ending June 30, 1863, to secure completeness in the medical statistics; and these efforts, although not crowned with perfect success, have had the effect of rendering the reports for that year comparatively complete, and the work of compiling them is progressing as rapidly as is possible with the clerical force employed.

"It is believed that, as the attention of the medical officers in service is now fully directed to the effort being made to compile these statistics, their hearty co-operation may be relied upon, and that the figures for the present year may be hoped to be as nearly complete as can be expected from any great army in time of war."

Monthly rates of camp fever in the armies of the United States during the year ending June 30, 1862, expressed in ratio per thousand of mean strength.

	1861.						1862.						
	July.	Augus.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	For the year.
Atlantic border..	8.30	18.78	25.60	27.64	27.88	19.74	18.85	13.81	10.99	17.42	24.88	27.07	238.99
Central region ..	15.94	34.07	38.06	36.57	85.38	26.00	21.98	18.15	16 46	23.71	29.59	27.64	319.49
Pacific border...	1.45	6.28	1.97	9.73	5.31	7.48	3.78	5.00	5.15	2.28	5.52	1.78	60.95

Monthly rates of diarrhœa and dysentery in the armies of the United States during the year ending June 30, 1862, expressed in ratio per thousand of mean strength.

	1861.						1862.						
	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	For the year.
Atlantic border..	168.23	116.29	70.80	62.66	46.00	28.54	23.20	22.20	35.23	67.20	70.92	87.06	646.01
Central region..	88.93	127.72	93.34	92.50	69.63	61 27	68.00	64.13	68.66	105.82	97.07	83.02	994.77
Pacific coast....	29.41	40.67	33.12	32 00	35.92	20.12	18.07	20.02	23.87	18.97	29.09	30.25	319.64

The statements we have here quoted cannot fail to interest every member of the profession, for they plainly foreshadow the accomplishment of most desirable ends in the conservation of life and military effectiveness in the national forces. As civilians, we confess our sense of obligation and hearty sympathy in the great work of sanitary inquiry that is silently going forward in the medical bureau and in the field, and we would earnestly conjure the surgeons of regiments and directors of corps to give the greatest practicable completeness and value to their stated inquiries and reports. It is by means of more comprehensive and complete statistical records and sanitary works that military surgeons are to command a more liberal treatment from the government; and this, certainly, is the least of the reasons for such faithfulness in duty.

THE WEEK.

The British *Medical Journal* raises the following pertinent inquiry relating to vivisections:—

"A noble lord, and, if we are not mistaken, a keeper of foxhounds (which sporting position may he long maintain!), is at the head of the Royal Society for Protection of Animals; and many honorable sporting gentlemen also support it. Now, the object of the Society is, as we understand it, to put down, as far as it may, all unnecessary pain which may be inflicted on animals; and, under this head, vivisections are denounced. Are these gentlemen, then, and this noble lord, ready, on the principles which they advocate, to put down their guns and their foxhounds? They are bound to do so on their own principles, if consistent. We have no hesitation in asserting that more pain (and manifestly unnecessary pain) and suffering is produced in animals by the gun of the sportsman on the 12th of August, the 1st of September, and the 1st of October, than is occasioned in any twenty years of vivisections, as practised in this country. The fact is obvious, and readily comprehensible to any one who will give the facts of the case due consideration. Out of every hundred animals shot at, a certain percentage get away *wounded*. What is meant by the term *wounded?* Why, simply this: that the animal has been vivisected by the shot which struck it; and that, according to the nature of the part so cut up, will the pain of the animal be great or small, of short or long duration. A hare goes off with a broken leg, the two sharp ends of the bone sticking through the skin; and he may live for days in this state, and even recover from it. What vivisecting process of the physiologist can be compared with the pain inflicted on this animal by the shot of the sportsman?" * * * The physiologist has this to say, which gives him an infinite superiority over the sportsman: he experiments with the object of relieving human suffering, and he operates whilst the animal is under chloroform. The sportsman has no other object than amusement in the business."

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The Sanitary Commission is holding a general meeting at Washington. This meeting will be important, as it is the first held since the retirement of Mr. Olmstead, the General Secretary. The business of the Commission is

enormous, extending to every branch of the army, and yet its energies do not flag.

In a recent report of Mr. Simon, Medical Officer to the English Privy Council, reference is made to the effect upon the human subject of meat infected with parasites, and the possible ill effects of consuming the flesh of animals affected with anthracite or anthracoid disease, such as the braxy of sheep, the black-quarter of horned cattle and sheep, tongue carbuncle, hog-cholera, parturition-fever of cows, or with infectious fevers. He is "of opinion that the absence of evidence is enough to show that immediate ill effects of any considerable importance do not ordinarily follow the consumption of meat" from animals which have been affected with pleuro-pneumonia and aphtha. In regard to the opinion that boils are caused by the consumption of diseased meat, he says: "Though I have not yet found any fact which I can deem conclusive in support of this opinion, I must admit that the alleged connexion is not *primâ facie* impossible."

Reviews.

A Treatise on Hygiene, with Especial Reference to the Military Service. By William A. Hammond, M.D., Surgeon-General U. S. Army; Fellow of the College of Physicians of Philadelphia; Member of the Philadelphia Pathological Society; of the Academy of Natural Sciences; of the American Philosophical Society; Honorary Corresponding Member of the British Medical Association, etc., etc. Philadelphia: J. B. Lippincott & Co. 1863. 8vo. pp. 604.

(*Concluded from page* 164.)

Dr. Hammond's observations upon the hygienic questions connected with the peculiarities of soils, locality, and climate, are worthy the attention of every military officer. Quoting M. Schübler's instructive tables, showing the hygroscopic properties of different soils, Dr. Hammond goes on to say, "that the argillaceous soils and those composed of humus are pre-eminently distinguished for their ability to absorb moisture. On this account ground which is in great part composed of these substances does not answer well for camping purposes. Perhaps the worst of all kinds of soil for camp is that in which sand and humus form the upper stratum, the lower or subsoil being formed of clay. . . . . Many camps have been rendered unhealthy solely, so far as could be perceived, through the bad character of the soil in respect to its power of absorbing and retaining moisture."

Respecting the capacity of different soils for retaining caloric, the author quotes his own experience in *bivouacking* as corroborating the definite experiments of Schübler, who has shown that calcareous sand, pure clay, and humus, stand related in this respect, as 100, 66, and 49. And as respects the important quality of soils in their capacity for absorbing organic exhalations or effluvia, and again yielding them under the oxidizing test of the alkaline permanganates, the author has, from his own neat experiments, derived the following results. The effluvia from a jar containing putrid meat, vegetables, and urine, being made to permeate a given quantity (250 grains) of each specimen of soil, and a measured current of fresh air being passed through the same soils, both previously and subsequently to that process of infusion with the effluvia, these numbers showed the cubic inches of air required as passed through to decolorize a standard solution of permanganate of potassa. The column A shows the result previous to the permeation of the soils by the effluvia; while the column B shows the subsequent result.

Kind of Soil.	A.	B.
Pure Sand	73.5	67.5
Dry Clay	59.	49.5
Sand, Clay, and Marl	64.5	58.
Humus	41.	11.5

Considered practically, with reference to the deodorizing and disinfecting power of dry earths and the different soils, these are interesting results; and as respects the relative value of sand and humus, these numbers probably give the true indications; but as respects albuminous soils there must be taken into consideration the remarkable avidity with which clay and other porous silicates of alumina and lime absorb and chemically combine ammonia, seizing upon it even in its ordinary conditions of combination in azotized effluvia, and transferring or fixing it in the clay. This property, as described by Liebig, Thompson, and Prof. Way, must be regarded as good proof of the value of dry, calcareous clays for absorbing and neutralizing animal effluvia.

Hospitals.—The hundred and forty pages that Dr. Hammond has devoted to hospitals, the principles of their construction, location, management in the field and in permanent institutions, their lighting, heating, ventilation, etc., are replete with practical instruction. Forty-two woodcuts, twenty-five of which are original, are given to illustrate the principles of construction; and as the author, in his duties as Surgeon-General of the army, must have realized the immense responsibility of ordering suitable provision for not less than a hundred thousand sick and wounded men during the first month of his administration of the Medical Bureau, and of supervising such provision for not less than two millions of cases in field and general hospitals during the succeeding twelve months of service, we feel assured beforehand that what he has written respecting military hospitals and their management cannot fail to command the attention of the medical profession and of the national Government.

After a summary review of the leading features of the more important hospitals of European and American cities, showing what errors and defects should be anticipated in the location, construction, and arrangement of hospital buildings, the author proceeds to state in a very lucid and emphatic manner the true principles of hospital-construction. The following paragraphs illustrate his views:—

"In setting out to build a hospital the first object to be had in view is the provision of ward accommodation; the next the provision of accessories, such as kitchens, water-closets, bath-rooms, offices, etc. We shall therefore first consider the best form for the ward, and the several appointments which should be given to it.

"*Wards.*—A hospital ward should be of an oblong shape, the form which is best adapted for the arrangement of beds, and supplying the patients with sufficient light and fresh air without wasting space. The width should not exceed twenty-five feet, a space which will allow seven feet six inches for the length of each bed, with a passage of ten feet between the rows. If the width is greater than this, the distance between the windows is such as to prevent free ventilation; if less, sufficient room is not afforded.

"In permanent hospitals the height should not be less than fourteen feet, nor over sixteen. Less than this renders the air close, while more is of little or no advantage. In temporary hospitals, such as those often required in the army during war, which are not ceiled, and which are ventilated at the ridge, twelve feet to the eaves will be found to answer if the roof is high pitched—the only kind which should be constructed, as flat roofs are more liable to leakage, and render a ward hotter in summer than those that are steep.

"The length of the ward depends upon the number of beds it is to contain. The bed should be about three feet in width, and the average distance between should be four feet. As they are arranged in pairs between the windows, the two beds of any one pair are not so far from each other as this; but compensation should be made by increasing the distance between the pairs, so that it may average about four feet. Each bed therefore occupies a space in the length of the ward of seven feet, consequently a ward intended for fifty beds—twenty-five on a side—would be $25 \times 7 = 175$ feet, the length of the ward. A ward therefore of these dimensions ($25 \times 175 \times 14$) contains 60,250 cubic feet, or 1205 cubic feet to each of the fifty patients.

"These dimensions are the very lowest which should exist in the wards of permanent hospitals in any part of the United States. Every patient in such institution should receive, as a *minimum allowance*, 1200 cubic feet of space, about 87 of which should be superficial. If less than this is allotted to him, an offence is committed against the laws of human health, which can only be excused on the ground of absolute necessity.

"In temporary hospitals, ventilated at the ridge and furnished with a sufficient number of windows, less than this will suffice, provided they are built after the plans which have been shown to be most advantageous to the sick and wounded who are to inhabit them; and consequently in such wards the length need not be so great as in those of permanently built hospitals. In these ridge ventilated wards, of the same width as the others and the same average height, the mean distance between the beds need not be more than two and a half feet; $25 \times 5\frac{1}{2} = 137\frac{1}{2}$ feet, the length of a ward intended for fifty patients. Such a sized ward contains 48,125 cubic feet, which is about 960 to each patient.

"This is the basis upon which all temporary hospitals should be constructed, and although, from the necessities of the service, it may often be impossible to give to each inmate as much space as the requirements of sanitary science demand, he should receive it without fail as soon as the exigency, which has caused a reduction in his allowance of space, has ceased to exist."

* * * * * *

"As has been said, the mean height of a ward should not be less than fourteen feet, and it is upon this, as a standard, that the cubic space per patient is to be apportioned. It will not answer to make the walls high and to curtail them proportionally in the other dimensions, for after the height of fourteen or fifteen feet is attained in a ward, the air of any space above that is of very little practical benefit to the patient. It is by no means impossible to produce sickness in well persons by crowding them together in the open air, where the number of cubic feet of air to each is only limited by the height of the atmosphere above the surface of the earth. The number of square feet to a patient, in a ward fourteen feet high, should not, in permanent hospitals, be less than eighty-five, nor in temporary, ridge ventilated wards, less than sixty-five feet.

"The windows of a ward should be of ample size, certainly not less than five feet in height. The number should be determined by the size and capacity of the ward, one being allowed for every two patients."

The plans of the General Hospitals at Fort Schuyler, Point Lookout, Chestnut Hill, and many others, are given in much detail. Like American ideas, those plans are expansive and quite untrammelled by foreign examples. To think of fifty pavilions—each 175 feet in length—arranged tangentially in radii from the periphery of an ellipsoidal court-yard, and there connected by a corridor nearly half a mile in length, which is the outline description of the Monroe Hospital at Chestnut Hill, must awaken some astonishment abroad, where the Titanic magnitude of our war for the Home of Freedom is yet imperfectly appreciated. We most admire the best of these hospital plans for their ventilation and generous allotment pro rata of air-space to the patients, and for the breadth of ground they occupy. And it may be pardonable for a civilian to offer a criticism upon all the larger hospital plans given in this volume: They are *too large*. The aggregation of 2,000 or 3,000 patients upon such limited areas, even under favorable conditions for local drainage and external ventilation, will inevitably, after a number of months, induce endemic or localized conditions of insalubrity that will certainly increase the average period of recovery of the patients as well as augment the ratio of mortality. Though war creates military necessities, its successful issue is so truly "a problem of sanitary science" that the question of life-saving is paramount to all others in the medical department of the army service. It has been well stated by the British Military Hospital Commission, that "it should never be forgotten that the object sought in the construction of a hospital is *the recovery of the larger number of sick men to health in the shortest possible time*, and that to this end everything else is only subsidiary."

Various statements respecting locality, altitudes, and climate, which we find in Dr. Hammond's chapters upon those subjects, warrant the belief that he is fully alive to the advantages that would be derived from the distribution of certain classes of the military patients to hospitals located at higher altitudes and in a drier atmosphere than at the tide level where the principal hospitals have hitherto been located. And in such improved locations we believe the administration will be found more economical, the death-rates lower, and the average period of hospital residence shorter.

The chapter on field-hospitals is exceedingly valuable, but too brief. Surgeon Vanderkieft's, in the oak-openings beyond the Antietam, is justly referred to as "a model for such establishments." We have preserved the statistics of the surgery in that and some other hospitals under canvas upon that bloody field, and never in civic hospitals do we expect to witness such favorable amputations, resections, and terrible wounds. Dr. Hammond strongly recommends that hospital tents or huts, when aggregated, should be arranged *en échelon* as a means of insuring the best ventilation.

Passing the chapters relating to the *lighting* and *warming* of hospitals, in which all is practically and clearly stated that concerns these important matters, we would quote largely from the most excellent chapter on *ventilation*, but like the sections which follow relating to *camps*, *food*, and *alimentary principles*, *physiological relations of food*, *compound aliments*, etc., we would cordially recommend every army officer to peruse these last chapters of the treatise first, for they are fullest of interest and practical suggestions. We cannot forbear the following brief quotations relating to heating, and to ventilation respectively, as illustrating the emphatic and definite opinions of the enlightened author. Speaking of the fashionable subterranean hot-air furnaces, he states:—

"It is only necessary to allow a piece of polished silver to stand for a few days in a room warmed in this manner to be convinced of the presence of the vapor of sulphur in the atmosphere, as the silver very rapidly becomes tarnished by the formation of the sulphuret. I have also caused the warmed air to pass through Liebig's potash bulbs, and have always found an excessive amount of carbonic acid to be present, and yet I have seen educated persons, or those who from their position in life ought to have known better, crowd themselves, to the number of five or six, into a room scarcely fifteen feet square in which there was no window, in which two gas burners were lighted, and with the doors shut, crouch over a flue from a red-hot furnace through which air hot enough to parch the skin was being discharged with horrible rapidity. Should it be a subject for surprise that such persons were annoyed with coldness of the extremities, and were haggard and ghastly-looking in the morning, and that they were afflicted with almost constant headaches, dyspepsia, and other affections

evincing disorder of the organism? As used in this country, hot-air furnaces, I have no hesitation in saying, are productive of more disease and discomfort than are caused by all the other means of producing artificial heat combined."

And respecting the amount of fresh air-supply to meet the physiological requirements of respiration, Dr. Hammond brings forth the following statement, which corresponds with the standard that our own observations long since led us to establish in the management of hospital wards.

"Thus Vierordt fixes the amount at 2½ cubic feet per minute, Dr. Reid at 10 cubic feet, and Dr. Arnott at 20 cubic feet. The first of these is undoubtedly too low, and the last cannot be considered as at all too high. From the nature of the problem to be solved, and from the many influences in operation capable of affecting the result, it is extremely difficult, if not impossible, to arrive at exactness. It may, however, be safely affirmed that, in a ward in which 1200 cubic feet of air are allowed to each patient, this amount should be entirely changed in each hour at the most, and this would require the admission of 20 cubic feet per minute for each patient. An allowance of 30 to 40 cubic feet per minute would, however, be far preferable. The object should be to render the atmosphere of the ward, as nearly as possible, similar in composition, as regards carbonic acid, aqueous vapor, and organic matter present, to that of the external air."

The closing chapters of the treatise treat especially of the alimentation and clothing of the soldier. Like all that precedes these subjects they are treated with reference to the practical questions and necessities of army life. The volume itself is a sort of epitome, as we imagine, of the first year's official duties of the Chief of the Army Medical Bureau. Indeed, this opinion is warranted by a casual remark in the preface, where the author says:—"There was no work then to which I could refer those who came to me for information; * * * and as I had for several years given a large portion of my leisure to the study of hygiene, * * I concluded to devote the hours which would otherwise have been passed in rest, in preparing a volume upon the more important subjects belonging to the science of hygiene, especially those that have a bearing upon the military service."

Of this work, which, to say the least, should command the grateful appreciation not only of public hygienists, but of the National Government, the author states, "It is not pretended this volume is complete. There are several subjects other than those considered, such as Occupation, Exercise, the Excretions, Marriage, Celibacy, etc., which I would have been glad to have taken up, had I not been convinced that the need for some work on sanitary matters was imperative."

This patriotic and noble motive for preparing the treatise is most appropriately and beautifully testified in the dedication of the volume to Dr. Wm. H. Van Buren, whose eminent position and distinguished labors in the medical profession, and in the United States Sanitary Commission, are thus appropriately recognised by his former pupil. And it is no trivial encomium upon this book to say that the style, scope, and subject matter of its well digested chapters, its advanced status in scientific as well as severely practical arguments and statements, together with the superior typographical execution and illustration of the volume, are in every respect worthy the distinguished position and repute of its author. It is a book that must make its way into every physician's library, and which will be demanded in every medical class-room; and its future and enlarged editions, or supplementary volumes, will be earnestly looked for by all the cultivators of sanitary science.

Erratum.—The writer of the review of Dr. Hammond's treatise requests a correction to be made in the first paragraph from the bottom of last column, on page 163, in last number of this Journal. The words *cubic inches* are to be substituted for *cubic feet*, wherever the latter words occur in that paragraph.

He adds the following facts: It will be observed that the experiments of Dr. Hammond and Dr. Angus Smith, have unequivocally demonstrated the fact, which has been believed upon rational grounds, that deleterious organic and putrefactive matter rapidly accumulates not only in crowded apartments but in unventilated and damp places. The following table gives some of the results of Dr. Smith's tests of the atmosphere of various localities, with reference to ascertaining the absolute proportion of such noxious matters liable to be respired in those places:—

		cub. in.
1.	Air at All Saints inside the laboratory 1 grain in	72,000
2.	Front of the house . . . . . „	74,000
3.	Behind the laboratory . . . . . „	60,000
4.	Bedroom looking to the back . . . „	64,000
5.	Same room in the morning after being slept in „	56,000
6.	Front of laboratory again . . . . „	76,000
7.	Back of the Medlock behind dirty houses „	44,000
8.	St. Michael's place behind a house . „	8,000
9.	Inside a house at St. Michael's-place . „	16,000
10.	The front of the house . . . . . „	40,000
11.	High grounds 30 miles north of Manchester „	209,000
12.	Closely packed railway carriage . . „	8,000
13.	When the strong smell of a sewer entered my laboratory . . . . . „	8,000

"Leaving out the three cyphers, we have a range of from 8 to 200, and I feel assured that we may go much lower than 8, as I entered no spots which were very revolting."

"The air of ash-pits, or rather of middens and cesspools such as the repositories of faeces essentially are in Manchester, was tried, and gave

grs.		cub ft.
1. 1	of organic matter in	62·2
2. 1	"	62·2
3. 1	"	58·9"

"We have in different air breathed by people in the same county, a substance the amount of which in one case is 22 times greater than in the other, and in air breathed by people in the same town a difference which is as 9 to 22.

"These differences are not greater than are required in order to enable us to account for the numbers which represent the deaths of the various districts. In the district in which the highest numbers here given were obtained, there were, in 1855, 4·5 deaths in a hundred, whilst the average is 2·2 for the country."

Such facts require no comment, but they are exceedingly instructive.

Army Medical Intelligence.

ORDERS, CHANGES, &c.

Surgeon J. Owen, U.S.V., has been dismissed the service of the United States.

Surgeon Madison Mills, U.S.A., has been relieved from duty in the Department of the Tennessee, and assigned as Medical Director to the Department of the Missouri.

Surgeon Josiah Simpson, U.S.A., Medical Director, Middle Department, has been ordered to visit and inspect in hospitals and elsewhere, such officers and soldiers belonging to regiments on duty in the Middle Department, as are reported at those Headquarters, "absent sick," beyond the expiration of their furloughs. He will designate to Provost-Marshals those fit for duty for immediate return to their regiments, and provide the necessary certificates of disability for discharge or transfer to the Invalid Corps, in cases requiring such action. All officers and men designated as fit for duty will be immediately sent to join their respective regiments.

Seven hundred wounded rebel prisoners have been ordered from Chester, Penn., to Point Lookout, Md.

A person, calling herself "Mrs. Major Gage, Surgeon U.S.V.," has been representing herself to Surgeons in charge of hospitals in the North, as holding the President's commission as such, and demanding quarters, fuel, etc. It is needless to say that no such person is known or recognisedby the Medical Department.

METEOROLOGY AND NECROLOGY OF THE WEEK IN THE CITY AND COUNTY OF NEW YORK.

Abstract of the Official Report.

From the 21st day of September to the 28th day of September, 1863.

Deaths.—Men, 119; women, 91; boys, 123; girls, 114; total, 447. Adults 210; children, 237; males, 242; females, 205; colored, 8. Infants under two years of age, 163. Children born of native parents, 18; foreign, 175.

Among the causes of death we notice:—Apoplexy, 9; infantile convulsions, 22; croup, 14; diphtherite, 16; scarlet fever, 5; typhus and typhoid fevers, 29; consumption, 64; small-pox, 0; measles, 1; dropsy in head, 5; infantile marasmus, 32; cholera-morbus, 0; cholera infantum, 29; inflammation of brain, 16; of bowels, 15; of lungs, 13; bronchitis, 7; effects of heat and sun-stroke, 0; erysipelas, 1; diarrhœa and dysentery, 37. 258 deaths occurred from acute diseases, and 39 from violent causes. 287 were native, and 160 foreign; of whom 107 came from Ireland; 62 died in the City Charities; of whom 16 were in Bellevue Hospital, and 17 in the Immigrant Institution.

Abstract of the Atmospherical Record of the Eastern Dispensary, kept in the Market Building, No. 57 Essex street, New York.

Sept. 1863.	SIX A.M.				TWO P.M.				TEN P.M.			
	Minimum Temp'ture	Temperature.	Evaporation Below.	Barometer.	Wind.	Temperature.	Evap. Below.	Barometer.	Wind.	Temperature.	Evap. Below.	Barometer.	Wind.
	°	°				°				°			
20th.	43	46	7	29.81	N.W.	51	9	29.81	N.	45	7	29.91	N.W.
21st.	40	43	8	29.91	"	62	15	29.24	S.W.	50	6	30.00	W.
22d.	42	44	9	30.21	"	55	11	30.24	W.	46	6	30.30	N.W.
23d.	40	41	8	30.31	N.E.	54	11	30.40	S.W.	47	5	30.33	S.W.
24th.	48	46	6	30.21	S.	61	8	30.17	S.	58	4.5	30.04	S.
25th.	45	50	3	29.96	"	58	4	29.91	S. by W.	46	4	29.90	N.E.
26th	42	43	6	29.91	N.W.	58	11	29.89	N.W.	44	7	29.91	N.W.

REMARKS.—20th. Variable sky, with fresh wind. 21st, 22d, 23rd, clear, with fresh wind. 24th, Fog early; clear day. 25th. Cloudy, light rain, afternoon. 26th, Clear, with fresh wind. Rain for the week one tenth of an inch.

From the 28th day of September to the 5th day of October, 1863.

Deaths.—Men, 109; women, 110; boys, 118; girls, 111; total, 448. Adults, 219; children, 229; males, 227; females, 221; colored, 5. Infants under two years of age, 157. Children born of native parents, 21; foreign, 163.

Among the causes of death we notice:—Apoplexy, 4; infantile convulsions, 26; croup, 14; diphtherite, 16; scarlet fever, 11; typhus and typhoid fevers, 14; consumption, 88; small-pox, 0; measles, 0; dropsy of head, 8; infantile marasmus, 32; cholera infantum, 18; inflammation of brain, 6; of bowels, 15; of lungs, 20; bronchitis, 9; congestion of brain, 0; of lungs, 0; erysipelas, 2; diarrhœa and dysentery, 20. 265 deaths occurred from acute diseases, and 43 from violent causes. 263 were native, and 185 foreign; of whom 125 came from Ireland; 69 died in the City Charities; of whom 16 were in Bellevue Hospital, and 9 in the Immigrant Institution.

Abstract of the Atmospherical Record of the Eastern Dispensary, kept in the Market Building, No. 57 Essex street, New York.

Sept. 1863.	SIX A.M.				TWO P.M.				TEN P.M.			
	Minim. Temp'ture	Temperature	Evaporation Below.	Barometer.	Wind.	Temperature	Evap. Below.	Barometer.	Wind.	Temperature	Evap. Below.	Barometer.	Wind.
	°	°				°				°			
27th.	41	43	6	29.90	W.	61	10	29.92	W.	46	7	30.01	N.W.
28th.	42	46	6	30.07	N.W.	64	10	30.11	W.	51	5	30.04	S.W.
29th.	46	48	4	30.14	Fog.	63	9	30.13	S.	53	6	30.12	S.
30th.	45	48	4	30.11	Fog.	64	8	30.11	S.	54	6	30.10	S.
1st.	50	50	5	30.13	S.W.	63	8	30.14	S.	58	5	30.09	S.
2d.	53	54	4	30.09	Fog.	64	6	30.00	S.	57	3	29.81	S.
3d.	57	58	4	29.67	S.	71	7	29.74	S.	63	4	29.90	S.

REMARKS.—27th and 28th. Clear day, with fresh wind. 29th and 30th, Clear day; fog A.M. 1st, Clear day. 2d, Cloudy; fog A.M.; rain P.M. 3d, Cloudy; sultry.

SPECIAL NOTICES.

SECTION OF MEDICAL PATHOLOGY AND PRACTICAL MEDICINE OF THE NEW YORK ACADEMY OF MEDICINE.—*The regular monthly meeting of this Section will be held at the house of the Chairman of the Section,* DR. H. D. BULKLEY, *No. 42 East 22d street, on Thursday next, 15th inst., at 8 o'clock, P.M.*

BELLEVUE HOSPITAL MEDICAL COLLEGE.—*The Annual Course of Lectures in this Institution will be opened on Wednesday, Oct. 14th, at eleven o'clock, A.M.—The Introductory Lecture will be given by* DR. STEPHEN SMITH, *and addresses will be made by the* HON. SIMEON DRAPER, *President of the Board of Trustees, and others.*

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JOHN TORREY, M.D., LL.D., Professor Emeritus of Chemistry and Botany.
JOSEPH MATHER SMITH, M.D., Professor of Materia Medica and Clinical Medicine.
ROBERT WATTS, M.D., Professor of Anatomy.
WILLARD PARKER, M.D., Professor of the Principles and Practice of Surgery and Surgical Anatomy.
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HENRY B. SANDS, M.D., Demonstrator of Anatomy.

The Preliminary Term for the Session of 1863–4 will commence on MONDAY, SEPTEMBER 21st, and continue four weeks, until the opening of the Regular Term in October.

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